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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/615,512	07/07/2003	Yung-Ho Chuang	KLAC0075	9347

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EXAMINER	
FINEMAN, LEE A	
ART UNIT	**PAPER NUMBER**
2872	

MAIL DATE	DELIVERY MODE
05/01/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/615,512	CHUANG ET AL.	
	Examiner	Art Unit	
	Lee Fineman	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 April 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,5-9,70 and 75-91* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,5-9,70 and 75-91* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2 April 2007 has been entered.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 75, 79-81, 83, 86 and 90 are rejected under 35 U.S.C. 102(b) as being anticipated by Chuang et al., US 6,064,517.

Regarding claims 75, 83 and 86, Chuang et al. disclose in figs. 13 and 17 a system for inspecting a specimen (704) comprising an illumination system (1301) able to provide light energy having a wavelength within a predetermined range; and an imaging subsystem (1702, fig. 17) oriented and configured to receive said light energy from said illumination system (see fig. fig. 13) and direct light energy toward said specimen (704), said imaging subsystem (1702, fig. 17) comprising a plurality of lenses (1708-1716) all aligned along an axis (fig. 17), being free of planar reflecting surfaces (see table in column 20) and having a diameter less than 100

millimeters (as the drawing are to scale, see column 12, lines 28-31, the diameter of the largest lens (1712) is approximately 50 mm); wherein the imaging subsystem is configured to provide a field size in excess of approximately 0.4 millimeters (4 mm, column 19, lines 52-55) at a numerical aperture of approximately 0.90 (.97, column 19, lines 52-55, it is noted that neither the specification nor the claim defines the term "approximately" in any degree of similarity. As such a numerical aperture of .97 is approximately .90) from the illumination system having the wavelength in the range of less than approximately 320 nanometers (column 20, lines 8-9). The method of utilizing the structure of the claim is inherent therein.

Regarding claim 79 and 90, Chuang et al. further disclose where the imaging and illumination subsystems support at least one of a group of inspection modes comprising bright field, ring dark field, directional dark field, full sky, aerial imaging, confocal, and fluorescence (abstract).

Regarding claim 80, Chuang et al. further disclose where the imaging subsystem uses a varifocal system for the full magnification range (fig. 22 and column 23, lines 18-19).

Regarding claim 81, Chuang et al. further disclose where separate imaging lenses are used for specific magnification increments (fig. 22 and column 23, lines 20-21).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 76 and 87 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chuang et al.

Chuang et al. disclose the claimed invention except for explicitly stating the illumination system's wavelength is in the range of approximately 285 to 320 nanometers. However, Chuang et al. does disclose in column 11, lines 36-43, that the objective may be used for light beams having different wavelengths from the infrared to the deep ultraviolet. It would have been obvious to one of ordinary skill in the art at the time the invention was make the wavelength of the illumination system any wavelength from the infrared to the deep ultraviolet, which includes the claimed range, to be able to examine different specimen characteristics under different light conditions.

5. Claims 1, 6-9, 82, 85 and 91 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chuang et al. in view of Shafer et al., U.S. Patent No. 5,717,518 (henceforth Shafer '518).

Regarding claims 1 and 6-8, Chuang et al. disclose the claimed invention except for explicitly stating the illumination system comprises an arc lamp having a wavelength in the range of less than approximately 320 nanometers. However, Chuang et al. does disclose in column 11, lines 36-43, that the objective may be used for light beams having different wavelengths from the infrared to the deep ultraviolet. Further, Shafer '518 teach in column 4, lines 1-24, that lasers and arc lamps are art-recognized equivalents. It would have been obvious to one of ordinary skill in the art at the time the invention was make the wavelength of the illumination system any wavelength from the infrared to the deep ultraviolet, which includes the claimed range, to be able to examine different specimen characteristics under different light

conditions. Further, it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the illumination system of Chuang with an arc lamp as suggested by Shafer '518, because it is a reliable, commonly available light source.

Regarding claims 9, 82, 85 and 91, Chuang et al. further disclose using the system for detection of particular object faults (column 3, lines 44-45) but does not explicitly state the system further comprising a data analysis subsystem for analyzing data representing the light energy reflected from the specimen, wherein the data analysis subsystem has the ability to record defect position for any defect on the specimen. Shafer '518 teach an imaging system (fig. 6) which includes a data analysis subsystem (92 and 96) for analyzing data representing the light energy reflected from the specimen (column 9, lines 20-26), wherein the data analysis subsystem has the ability to record defect position for any defect on the specimen (into 98). It would have been obvious to one of ordinary skill in the art at the time the invention was made to add the data analysis subsystem of Shafer '518 to the system of Chuang et al. to be able to analyze and store the images that are detected (Shafer '518, column 9, lines 20-26).

6. Claims 1, 2, 5, 70, 75-78, 83, 84 and 86-89 are under 35 U.S.C. 103(a) as being unpatentable over Liang, US 2004/0051957 A1 in view of Shafer et al., US 2001/0040722 A1, (henceforth Shafer '722).

Liang discloses a microscope objective including an imaging system (see, e.g. figs. 4-8) comprising a plurality of lenses (e.g., 32-38; fig. 8) all aligned along an axis (figs. 4-8), being free of planar reflecting surfaces (e.g., table 4) and having a diameter less than 100 millimeters

(e.g., table 4); wherein the imaging subsystem is configured to provide a field size in excess of approximately 0.4 millimeters (see at least page 2, section [0010] and claim 2) at a numerical aperture of approximately 0.90 (see at least page 2, section [0010] and claim 1) from the illumination system having the wavelength in the range of less than approximately 320 nanometers (page 6, section [0073]). Liang does not explicitly state that the objective is part of a system for inspecting a specimen including an illumination comprising an arc lamp having a wavelength in the range of less than approximately 320 nanometers. Further, Liang lacks the plurality of elements comprising a Mangin mirror arrangement or collection optics for collecting light energy reflected from said specimen, wherein the collection optics are catadioptric, and catadioptric optics support wavelengths from approximately 266-600 nm. Shafer '722 teaches figs. 1 and 3, a system (fig. 1) for inspecting a specimen comprising: an illumination system (101) comprising an arc light able to provide light energy having a wavelength in the range of approximately 285 to 320 nanometers (see page 4, section [0056]); and an imaging subsystem (fig. 3) oriented and configured to receive said light energy from said illumination system and direct light energy toward said specimen, said imaging subsystem comprising a plurality of elements having a diameter less than 100 millimeters (as the drawing is to scale, all elements are less than 100 millimeters), wherein said plurality of optical elements also comprises a mangin mirror arrangement (306) and collection optics (102) for collecting light energy reflected from said specimen (fig. 1), wherein the collection optics are catadioptric (102 and fig. 3); and wherein the catadioptric optics support wavelengths from approximately 266-600 nm (in at least so far as this wavelength range will pass through the optics). First, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add an illumination system

including an arc lamp as taught by Shafer '722 to provide a well known microscope system to investigate samples. Further, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add a mangin mirror/catadioptric collection optic as taught by Shafer '722 to the system to correct/prevent/minimize chromatic aberrations (Shafer '722, page 6, section [0082]).

Response to Arguments

7. Applicant's arguments filed 2 April 2007 have been fully considered but they are not persuasive.

Applicant argues that Chuang et al. does not anticipate claims 75, 79-81, 83, 86 and 90 because the plurality of elements must include the Mangin mirror (which does not meet the diameter limitation) based on the requirement to "direct light energy toward said specimen." The examiner respectfully disagrees. The claims recite open-ended language, i.e., comprising. This reference includes an imaging subsystem (1702, fig. 17) including a plurality of lenses (1708-1716) configured to direct light energy toward said specimen (704, see fig. 17). These lenses (1708-1716) meet all the requirements of the imaging subsystem as claimed. Thus, reliance upon the Chaung et al. reference is appropriate.

Applicant further argues that the scope of Liang's disclosure of the field of view (FOV) being "substantially 220-240 μm or more" does not extend to/support a design having a FOV of over 0.4 mm as claimed because it is an approximately 66% increase over the supported FOV values of Liang (It is noted that the applicants calculation of a 2.5 FOV to OD ratio is incorrectly based on an OD of 0.16 mm instead of 1.6 mm and therefore 1666% increase is also incorrect -

0.4/1.6=0.25). The examiner respectfully disagrees because Liang discloses a range of values is not limited to the specific values the applicant is arguing. It is also noted that numbers that the applicant has stated in the arguments (over 0.4 mm) is more limiting that the broad recitation actually present in the claim, i.e., "in excess of approximately 0.4 millimeters" (which is an open-ended range).

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). Using an arc lamp as the light source because it is a reliable, commonly available light source and an art-recognized equivalent of the laser (Shafer '518, column 4, lines 1-24) and adding a mangin mirror/catadioptric collection optic to correct/prevent/minimize chromatic aberrations (Shafer '722, page 6, section [0082]) is knowledge which was within the level of ordinary skill at the time the claimed invention was made.

Conclusion

8. All claims are drawn to the same invention claimed in the application prior to the entry of the submission under 37 CFR 1.114 and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the application prior to entry under

37 CFR 1.114. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action after the filing of a request for continued examination and the submission under 37 CFR 1.114. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lee Fineman whose telephone number is (571) 272-2313. The examiner can normally be reached on Monday - Friday 7:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephone B. Allen can be reached on (571) 272-2434. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LAF
20 April 2007

MARK A. ROBINSON
PRIMARY EXAMINER